

Please cancel claims 1 through 15; please add the following new claims 16- 41 (a clean version of the claims can be found in Appendix A):

16. A polymer comprising either one or more saturated alkyl or fluoroalkyl carbon links, wherein said links connect alternating nitrogen, sulfur or oxygen atoms, alternatively, said links connect either an oxygen, nitrogen or sulfur atom through one or more saturated aryl, alkyl or fluoroalkyl carbon links to an oxy-phosphorous group, an oxy-silicon group oxyboron, oxyaluminium group or a combination thereof, wherein said oxy-phosphorous group can have a valence of III or V, and wherein said linkage includes crosslinkage.

17. The polymer of claim 16, wherein said polymer has a molecular weight (M_n) of about 200 to about 1 million.

18. The polymer of claim 17, wherein said polymer comprises alternating oxygen and nitrogen atoms and linked via saturated aryl, alkyl or fluoroalkyl carbon linkers.

19. The polymer of claim 17, wherein said polymer comprises alternating oxygen and sulfur atoms and linked via saturated aryl, alkyl or fluoroalkyl carbon linkers.

20. The polymer of claim 17, wherein said polymer comprises alternating sulfur and nitrogen atoms and linked via saturated aryl, alkyl or fluoroalkyl carbon linkers.

21. The polymer of claim 17, wherein said polymer comprises alternating oxygen atoms and oxyphosphorous groups and linked via saturated aryl, alkyl or fluoroalkyl carbon linkers.

22. The polymer of claim 17, wherein said polymer comprises alternating oxygen atoms and oxysilicon groups and linked via saturated aryl, alkyl or fluoroalkyl carbon linkers.

23. The polymer of claim 17, wherein said polymer comprises alternating nitrogen atoms and oxyphosphorous groups and linked via saturated aryl, alkyl or fluoroalkyl carbon linkers.

24. The polymer of claim 23 further comprising an electrolyte salt, wherein said salt has a weight ratio sufficient to form a polymer electrolyte, and wherein said salt is selected from the group consisting of alkali metal, quaternary ammonium, quaternary phosphonium, sulfonylimide, and sulfonylmethide.

25. The polymer of claim 24, wherein said polymer is cast as a film.

26. The polymer of claim 17 or 23, wherein said nitrogen atoms are either fully or partially substituted with one or more aryl, alkyl or fluoroalkyl tertiary substituents.

27. The polymer of claim 26 further comprising an electrolyte salt, wherein said salt has a weight ratio sufficient to form a polymer electrolyte, and wherein said salt is selected from the group consisting of alkali metal, quaternary ammonium, quaternary phosphonium, sulfonylimide, and sulfonylmethide.

28. The polymer of claim 27, wherein said polymer is cast as a film.

29. The polymer of claim 17 or 23, wherein one or more phosphorous atoms of said polymer are either fully or partially substituted with one or more aryl, alkyl or fluoroalkyl tertiary substituents.

30. The polymer of claim 17 or 23, wherein said nitrogen and phosphorous atoms are either fully or partially substituted with one or more aryl, alkyl or fluoroalkyl substituents.

31. The polymer of claim 16, wherein said polymer is an oxyphosphorous polymer, and wherein said oxyphosphorous polymer is combined with a group selected from the group consisting of oxysilicon, oxyboron, oxyaluminium and a combination thereof.

32. The polymer of claim 16, wherein said links comprise (i) two to four carbons in length, and (ii) one or more aryl, alkyl or fluoroalkyl branches.

33. The polymer of claim 16, wherein said links comprise one or more side chain substituents.

34. A solid polymer electrolyte, comprising (i) at least one polymer from claim 16, and (ii) at least one electrolyte salt.

35. The polymer of claim 34 further comprising an electrolyte salt, wherein said salt has a weight ratio sufficient to form a polymer electrolyte, and wherein said salt is selected from the group consisting of alkali metal, quaternary ammonium, quaternary phosphonium, sulfonylimide, and sulfonylmethide.

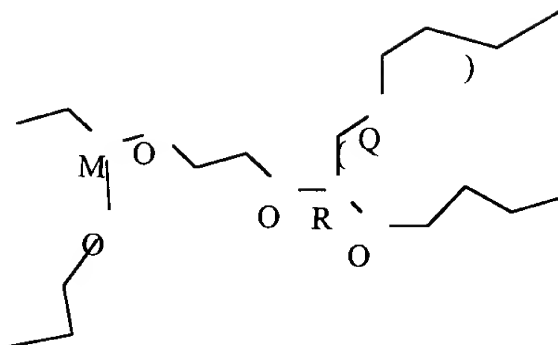
36. The polymer of claim 35, wherein said polymer is cast as a film.

37. A polymer having the following formula:



wherein R, R¹, and R² are selected from the group consisting of alkyl, alkylene and aryl hydrocarbons, and wherein "n" is an integer from 1 to 10,000.

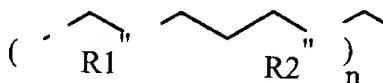
38. A polymer having the following structure:



wherein R is an element selected from the group consisting of P, B, and Al, wherein M is an element that is either Si or Ti, wherein Q is an element chosen from the group consisting of S, O, and N, and wherein said phosphorous is either in the +3 or +5 oxidation state.

39. The polymer of claim 38, wherein said polymer has a molecular weight (M_n) ranging from about 400 to about 1,000,000.

40. A polymer having the following structure:



wherein R1 is an element selected from the group consisting of O, N, B, and S, wherein R2 is an element selected from the group consisting of O and P, wherein said phosphorus is either in the +3 or +5 oxidation state.

41. The polymer of claim 40, wherein said polymer has a molecular weight (M_n) ranging from about 400 to about 1,000,000.